Request to Correct Inventorship under 37 C.F.R § 1.48(b)

Pursuant to 37 C.F.R § 1.48(b) and M.P.E.P. 201.3(III), Applicants here by request that the following co-inventors:

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be removed as co-inventors of the present patent application due to the cancellation of claims 18-73 in response to a restriction requirement.

Remarks

The courtesy extended by Examiner Hodge and Supervisory Examiner Ryan to co-inventor Andrew Curello and the undersigned is greatly appreciated. Previously uncited U.S. 6,932,847 to Amendola, which was discussed at the interview, is submitted herewith in a supplemental IDS along with newly uncovered US 7,105,033 to Strizki, US 6,645,651 to Hockaday and US 6,544,400 to Hockakay. These newly cited references are also discussed below with respect to the pending claims.

Claims 3 and 4 stand rejected under 35 U.S.C. § 112, 2nd ¶, for lack of antecedent basis. Claim 3 has been amended and claim 4 has been canceled. Applicants respectfully request that this rejection be withdrawn.

Claims 1-7, 11-13, 15-17 and 74 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent application publication no. 2003/0138679 to Prased, as stated in the Office Action.

Claims 1-7, 11-13 and 15-17 also stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent application publication no. 2003/0082427 to Prasad, as stated in the Office Action.

Claims 8 and 9 stand rejected under 35 U.S.C. § 103 as being obvious by U.S. patent application publication to Prasad, as stated in the Office Action. Claim 14 is rejected under 35 U.S.C. § 103 as being obvious over Prased and AAPA.

The allowance of claim 10 over the cited art is noted with appreciation. The rejections based on cited art are addressed below.

Claims 2, 4, 74 are canceled by this amendment. Claims 18-73 were previously canceled. Claims 75-116 have been added. Supports for all these new claims can be found in the specification from page 7, line 12 to page 9, line 22, which supports FIG. 1 elected by Applicants. Specific supports for these new claims are summarized below.

New claims	Supports
75-77, 82-84, 92, 94, 102-104, 115-116	Page 8, lines 23 to Page 9, line2
78, 90, 98, 108, 112	FIG. 1 (valve 26), page 8, lines 7-8
79, 100, 110, 111	Page 8, lines 3-7, Page 9, lines 2-15
80, 81, 85, 86, 95, 96, 105, 106	original claim 1
87, 88	original claims 5-6
89, 97, 107	FIG. 1, Page 7, lines 19-30
91, 99, 109, 113	FIG. 1 (pump 24, 28) , Page 8, lines 2-3
93, 101, 114	original claim 2

As amended, claim 1 reads as follows:

> A fuel supply containing a fuel for use by a fuel cell comprising:
>
> a first fuel compartment containing the fuel, a second reactant compartment, and a third reaction chamber;
>
> wherein the fuel is transported by *a pump* from the first fuel compartment to the third reaction chamber, where the fuel reacts to form reactants comprising hydrogen gas and liquid reactant, and thereafter the hydrogen gas and liquid reactant are transported *through a channel* to the second reactant compartment, wherein *the pump meters a rate of flow of fuel from the first fuel compartment to the third reaction chamber*; and
>
> wherein the second reactant compartment comprises *a gas permeable, liquid impermeable membrane disposed on a wall of the second reactant compartment*, and the hydrogen gas passes through the gas permeable, liquid impermeable membrane and out of the second reactant compartment to the fuel cell and the liquid reactant remains in the second reactant compartment.

(underlines and brackets omitted for clarity; *emphasis in italics*). To avoid further confusion, fuel compartment (14) is now referred to as the first fuel compartment; reactant compartment (16) is now referred to as the second reactant compartment; and reaction chamber (22) is now referred to as the third reaction compartment. Additionally, the "reactants" are now referred to separately as hydrogen gas and a liquid reactant.

Claims 2, 4 and 74 have been canceled and their subject matters (gas permeable, liquid impermeable membrane, pump to transport fuel, the second reactant compartment retaining the liquid reactant, respectively) have been incorporated into amended claim 1. Support for the functional limitation that the "pump meters a rate of flow of fuel" can be found on page 8, lines 2-3 ("a pump can regulate when the flow of fuel should start or stop by turning on or off and the pump can meter or control the rate of flow"). Support for the "channel" that communicates the hydrogen gas and liquid reactant from the third reaction chamber to the second reactant compartment can be found on page 8, line 15, and the channel labeled as "30" in FIG. 1.

Claim 1, as amended, is patentable over both the Prasad and the Prased references. As discussed at the interview, the Prased reference (US 2003/0138679) discloses a reaction chamber 104 that allows hydrogen gas to exit the reaction chamber at connector 114. Only the liquid byproduct is transported to the reactant chamber 106. Applicants also addressed at the interview the Examiner's assertion of a gas permeable, liquid impermeable wall that could separate reaction chamber 104 into two compartments, *i.e.*, an internal reaction region (e.g., 180) and a gas collection area 192. Even this interpretation cannot anticipates or renders obvious claim 1, because this interpretation requires that from the reaction chamber 180 hydrogen gas be transported to one chamber (192) and the liquid byproduct (BP) be transported to a different chamber (106). Claim 1, as originally filed and as currently amended, requires that both the hydrogen gas and the liquid reactant go into a single compartment (the second reactant compartment) after leaving the third reaction chamber. Hence, claim 1 is patentable over the Prased reference.

Claim 1, as amended, is also patentable over the Prasad reference (US 2003/0082427). The Examiner relies principally on fuel supplies 20, 320 and 420 (See FIGS. 13 and 14 of Prasad). Referring to fuel supply 20, Prasad clearly states that area 26 only stores waste solution (see paragraphs [0021] and [0024]). Referring to fuel supply 320, FIG. 13 and paragraphs [0054]-[0058] clearly show that hydrogen is transported directly to the fuel cell 350 from reaction chamber 340 and only the waste solution is transported back to waste area 326. Referring to fuel supply 420, FIG. 14 and paragraphs [0059]-[0060] show a similar configuration, except with a second fuel storage, which is not relevant here. Hence, claim 1 is also patentable over the Prasad reference for substantially the same reason stated above.

Claim 1, as amended, is also patentable over US 6,932,847 to Amendola, which was discussed at length during the interview. As shown in FIG.1, Amendola generally shows a hydrogen generator with fuel being stored in bladder 101, 118, fuel is transported up dip tube 112 by pump 105. The fuel is then passed through catalyst chamber 107 where reaction takes place to produce hydrogen and byproducts. The hydrogen and byproducts are transported through spent tube 109 into spent fuel container 102. From spent fuel container 102, hydrogen gas is produced through hydrogen line 110 and control valve. (See generally cols. 4-6). In another embodiment shown in FIG. 4, separating device 401 can be attached either near catalyst chamber 107 or along spent fuel line 109 to allow hydrogen to be produced from the device. Separating device 401 may contain a membrane to release hydrogen gas. (See generally col. 9, lines 45-59). In this embodiment of FIG. 4, however, only the liquid reactant is transported to spent fuel container 102, similar to the Prased and Prasad references.

Claim 1 has been amended to require that "a gas permeable, liquid impermeable membrane disposed on a wall of the second reactant compartment." This feature is missing from the Amendola reference, since spent fuel container 102 of Amendola shows no such membrane, and for this reason alone amended claim 1 is patentable over Amendola.

Furthermore, claim 1 has been amended to recite that "hydrogen gas and liquid reactant are transported *through a channel* to the second reactant compartment" and that "the hydrogen gas passes through the gas permeable, liquid impermeable membrane and out of the second reactant compartment to the fuel cell." At best, Amendola shows passing hydrogen gas out from either the reaction/catalyst chamber 107 (similar to Prased and Prasad) or through spent fuel tube 109. Contrarily, claim 1 requires that hydrogen is transported from the second reactant compartment, not from the reaction chamber and not from the channel connecting the reaction chamber to the second reactant compartment. For this additional reason, amended claim 1 is further patentable over Amendola.

Claim 1, as amended, is also patentable over newly uncovered US 7,105,033 to Strizki. Strizki discloses a hydrogen generator that has a fuel storage chamber 12 and a hydrogen separation chamber 14 separated from each other by a flexible partition 16, as shown in FIG. 1. As further discussed from col. 3, line 61 to col. 4, line 2, flexible partition 16 can be a ribbon spring or preformed flexible plastic that has "an intrinsic tension and can maintain an applied pressure on the fuel solution… [and] it compresses the fuel solution and forces that fuel solution out of the fuel storage chamber and into fuel conduit 18." Hence, this partition 16 provides the power or energy to push the fuel through conduit 18 and shut-off valve 30 to the reaction chamber 22. The hydrogen gas and liquid reactant are then transported though outlet conduit 28 to separation chamber 14, where hydrogen passes through gas permeable membrane 33 to outlet 28. It is important to note that Strizki describes a pre-loaded system, *i.e.*, flexible partition 16 is pre-stressed when fuel chamber 12 is full and as flexible partition 16 relaxes it pushes fuel out. The only other potential energy source available to push fuel is the weight of the liquid byproduct or spent fuel 14 applied on top of flexible partition 16. (See col. 5, lines 3-13). Hence, it is advantageous to have the spent fuel compartment on top of the fuel compartment.

The embodiments shown in FIGS. 2 and 3 of Strizki confirms this operation, where flexible partition 16 is replaced by wall 38 biased by spring 52. Additionally, the liquid byproduct 14 is also located on top of the fuel chamber 12.

On the other hand, claim 1 requires among other things a pump to provide the power to transport fuel from the first fuel compartment to the third reaction chamber. Claim 1 further requires that the pump meters the flow of fuel. Strizki teaches no pump and no way to meter the fuel using a pump, but discloses a different theory of operation than claim 1, and also teaches away from claim 1. Hence, claim 1 as amended is patentable over Strizki.

Claim 1, as amended, is also patentable over the other references listed on the attached supplemental IDS. More specifically, US 6,544,400 to Hockaday and US 6,645,651 to

Hockaday do not disclose transporting fuel to a reaction chamber and then transporting both the hydrogen and liquid byproduct to another reactant compartment where the hydrogen is separated. These two references also do not disclose using a pump to transport fuel.

Hence, Applicants submit that claim 1 as amended is patentable over the known art. Claims 3, 5-17, 75-81 depend directly or indirectly from claim 1 and are therefore also patentable. Applicants reserve the right to further support their patentability should that becomes necessary.

New independent claim 82 reads on the elected FIG. 1, and is therefore proper. Claim 82 is patentable over the known prior art, because none of these references disclosed that "a pressure differential is required for hydrogen gas to pass through the gas permeable, liquid impermeable membrane so that a pressure in the second reactant compartment is higher than a pressure in the first fuel compartment," as claimed. Hence, Applicants submit that new independent claim 82 is patentable over the known art. Claims 83-91 and 110 depend directly or indirectly from claim 82 and are therefore also patentable. Applicants reserve the right to further support their patentability should that becomes necessary.

New independent claim 92 reads on the elected FIG. 1, and is therefore proper. Claim 92 is patentable over the known prior art, because none of these references disclosed that "a pressure differential device, said pressure differential device requires a pressure differential for hydrogen gas to pass therethrough to ensure that a pressure in the second reactant compartment is higher than a pressure in the first fuel compartment," as claimed. Hence, Applicants submit that new independent claim 92 is patentable over the known art. Claims 93-99 and 111 depend directly or indirectly from claim 92 and are therefore also patentable. Applicants reserve the right to further support their patentability should that becomes necessary.

New independent claim 100 reads on the elected FIG. 1, and is therefore proper. Claim 100 is patentable over the known prior art, because none of these references disclosed that "wherein the fuel is transported through a channel from the first fuel compartment to the third reaction chamber … *said channel comprises a wicking material* … wherein when the shut-off valve is closed *the back pressure stops the flow of fuel* into the third reaction chamber to stop the reaction of fuel," as claimed. Hence, Applicants submit that new independent claim 100 is patentable over the known art. Claims 101-109 depend directly or indirectly from claim 100 and are therefore also patentable. Applicants reserve the right to further support their patentability should that becomes necessary.

New independent claim 112 reads on elected FIG.1, and is therefore proper. Claim 112 recites "a *single* valve is positioned between the first fuel compartment and the third reaction chamber and wherein the valve is one-directional." FIG.1 of the present application clearly indicates that this direction is from the first fuel compartment to the third reaction chamber. No known art discloses this feature. Strizki at best discloses a shut-off valve 30; however, there is no teaching that this valve would prevent back flow when it is opened. Hence, claim 112 and dependent claims 113-114 are patentable over Strizki and the known art.

In light of the preceding, Applicants respectfully submit that the presently pending claims are in condition for allowance and Applicants respectfully request the correction of Inventorship as stated above. The Examiner is invited to telephone the undersigned attorney of record if it is believed that such a call would materially advance the prosecution and eventual allowance of the present application.

57 claims (5 of which are independent) are currently pending. The highest number of claims previously paid is 113 claims (11 of which are independent). Hence, no fee for additional claims is due.

A fee of $130 is due for the request to correct Inventorship, a fee of $180 for the submission of the IDS after a non-final office action, and a one-month extension fee of $120 are paid herewith. Applicants believe that no other fees are due in connection with the submission of this Response. If any fees are due, however, Applicants hereby authorize the Commissioner to charge the appropriate fees to The H.T. Than Law Group, Deposit Account No. 50-1980.

Respectfully submitted,

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Attachments:
- Supplemental IDS
- One-month extension of time petition